SCOPE OF CLAIMS:

1. An electromagnetic induction actuator that has, within a cylindrical housing, a magnetic circuit that comprises a pole piece and a magnet connected as one piece, and a yoke that holds the pole piece together with the magnet, and a magnetic gap formed between the yoke and the pole piece, the magnetic circuit being suspended within the housing by spring suspension;

a diaphragm, which attaches a voice coil on inward surface side, the voice coil projecting into the magnetic gap and the diaphragm extending inside the housing at an open side;

metal terminals that are attached to a terminal block that projects outward from the side wall of the housing; and lead wires that electrically connect the voice coil and the metal terminals;

in which the metal terminal attached to the terminal block is formed of a leaf spring, so that pressing the metal terminal against the conduction pattern of a circuit board forms an electrical connection to the circuit board.

2. A structure for mounting the electromagnetic induction actuator of this invention that has within a cylindrical housing, a magnetic circuit that comprises a pole piece and a magnet connected as one piece, and a yoke that holds the pole piece together with the magnet, and a magnetic gap formed between the yoke and the pole piece, the magnetic circuit being suspended within the housing by spring suspensions;

a diaphragm, which attaches a voice coil on inward surface side, the voice coil projecting into the magnetic gap and the diaphragm extending inside the housing at an open side;

metal terminals that are attached to a terminal block that projects outward from the side wall of the housing; and lead wires that electrically connect the voice coil and the metal terminals, and the structure is formed that connecting the metal terminals against the conduction pattern of a circuit board and providing in outer casing;

in which there is the metal terminals attached to the terminal block is formed of leaf springs, and the metal terminals extend to the outward side of the housing that the side is opposite side of the open side of the housing in which the diaphragm is fitted and fixed, and there is a pad of elastic material is sandwiched between the open side of the housing and

the surface of the circuit board on the side where the leaf metal terminals project, so that pressing the metal terminal against the conduction pattern of the circuit board forms an electrical connection to the circuit board.

3. A structure for mounting an electromagnetic induction actuator as described in claim 2 above, in which the terminal block has a metal terminal that is a leaf spring of which the tip is bent in a V shape, with the knuckle slanting outward from the housing, and the leaf spring pressed flexibly against the conductive pattern of the circuit board to make the electrical connection between the metal terminal and the conduction pattern of the circuit board.

4. A structure for mounting an electromagnetic induction actuator as described in claim 2 or 3 above, in which there is a bushing of elastic material with circular extension flanges that covers from the outside the side wall of the housing, except for the terminal block for the metal terminals, and that covers the open sides of the housing, such that the extension flange that covers one open side of the housing becomes a pad that is sandwiched between the housing and the surface of the circuit board, and the extension flange that covers the other opens side of the housing is positioned inside the outer casing as a seal that surrounds the sound holes.

5. A structure for mounting an electromagnetic induction actuator as described in claim 4 above, in which there is a projection around the outer periphery of the side wall of the bushing, and an outer casing or circuit board with a stop rim that has concavity that fits the projection of the bushing, such that fitting the projection of the bushing into the concavity attaches the electromagnetic induction actuator that includes a bushing to the stop rim of the outer casing or circuit board.

6. A structure for mounting an electromagnetic induction actuator as described in claim 2 or 3 above, in which there is a housing with plural projections of elastic material at intervals along the outer periphery of the side wall and there is an outer casing or circuit board with a stop rim having concavities into which the projections of the housing fit, such that fitting the projections of the housing into the concavities attaches the electromagnetic induction actuator to the stop rim of the outer casing or circuit board.

7. A structure for mounting an electromagnetic induction actuator as described in claim 6 above, in which the elastic material that covers an open side of the housing acts as a pad sandwiched between that open side of the housing and the surface of the circuit board, and the seal material that covers the other open side encloses the sound holes and fits into the inner surface of the outer casing.

8. A structure for mounting an electromagnetic induction actuator as described in claim 2 through 7 above, in which there is a circular projecting band of elastic material that faces the surface of the circuit board, the circular band being sandwiched between one open side of the housing and the surface of the circuit board as a pad that is deformed by compression.

9. A structure for mounting an electromagnetic induction actuator as described in claim 2 through 8 above, in which the electromagnetic induction actuator is suited to mounting within a portable telephone.

10. An electromagnetic induction actuator that has, within a cylindrical housing, a magnetic circuit that comprises a pole piece and a magnet connected as one piece, and a yoke that holds the pole piece together with the magnet, and a magnetic gap formed between the yoke and the pole piece, the magnetic circuit being suspended within the housing by spring suspensions;

a diaphragm, which attaches a voice coil on inward surface side, the voice coil projecting into the magnetic gap and the diaphragm extending inside the housing at an open side;

metal terminals that are attached to a terminal block that projects outward from the side wall of the housing; and lead wires that electrically connect the voice coil and the metal terminals;

in which the metal terminals are made of leaf springs, and the metal terminals comprise contact points that connect electrically to the conduction pattern of the circuit board are on the side where the diaphragm is mounted, and flat plates that are electrically connected to the voice coil lead wires being taken out to the outward side of the housing, additionally these wires are taken out to the side opposite the side where the diaphragm is mounted, and these wires are attached to leaf spring terminal fittings on the side opposite, the voice coil

lead wires being divided by positive and negative polarity and electrically connecting the side where the diaphragm is mounted to the flat plates of the metal terminals, with the side where the diaphragm is mounted facing the surface of the circuit board, and mounted upside-down in the equipment case.

11. An electromagnetic induction actuator as described in claim 10 above, in which the terminal block has in its center a slit that divides it for positive and negative polarities, the voice coil lead wires being taken out to the outward side of the housing go through the slit of the terminal block, and are taken out from the side where the diaphragm is mounted to the opposite side of the side where the diaphragm is mounted, and the lead wires are divided by positive and negative polarity and are connected electrically to the flat plates of the metal terminals.

12. An electromagnetic induction actuator as described in claim 10 above, in which there is terminal blocks for positive and negative polarity comprise sink in the center of the terminal block, top plates and bottom plates of the sink, and side plates of the sink projecting further than the top plates and the bottom plates;

and in which the metal terminals, each having a fitted bend in the center with a left-opening box-shaped, upward from the top of the fitted bend by a given interval is the parallel flat plate to which the lead wire, and downward from the fitted bend the leaf spring extends at a slant and is then rounded upward with a contact point that contact the conduction pattern;

such that when the fitted bend is inserted into the sink, and the top plate of the terminal block is clamped between the top of the fitted bend and the flat plate for attachment of a lead wire, the contact point for connection to the conductive pattern of the circuit board projects from the bottom plate, and the terminal fittings is supported by the two side plates, the terminal fittings firmly attached to the terminal block.

13. An electromagnetic induction actuator as described in claim 12 above, in which the metal terminals have a number of teeth projecting outward from both sides of top of the fitting bend and spring arms that extend from the top of the fitting bend;

and the terminal blocks has spaces that correspond to thickness of the spring arms and receiving plates that face the top plates on the inner face of side plates;

and the spring arms fit between the top plate of the terminal block and the receiving plate of the side plates, and the teeth are compressed by the inner face of side plates, thus the terminal fittings firmly attached to the terminal block.

14. An electromagnetic induction actuator as described in claim 12 above, in which the metal terminals have wing-shaped leaf spring that curve outward at the tip of the leaf springs where wing-shaped leaf springs are bent back from the contact points and that extend toward the sides of the terminal block,

and the terminal block has receiving plates on the inner walls of its side plates that stop and support the wing-shaped leaf springs when the leaf spring is compressed, such that the metal terminals are mounted in the terminal block by a fitted structure that allows spring movement of the contact points.

15. An electromagnetic induction actuator as described in claim 14 above, in which there is a metal terminal which has, running along the center of the curve of the contact point, a projecting band that contacts the power feed land of the circuit board.

16. Portable information equipment, such as a portable telephone, that produces vibration, an audible ring or buzz by means of an electromagnetic induction actuator as described in any one of claims 10 through 15 above.